

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

***PATENT***

Inventor:	Clubb, et al.	Docket No.:	AZMED.0217
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TITLE:	METHOD FOR MANUFACTURING INTRALUMINAL DEVICE		

**STATEMENT OF CLAIM STATUS AND SUPPORT  
PURSUANT TO 37 C.F.R. 1.173(c)**

Commissioner for Patents  
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Commissioner:

Pursuant to 37 CFR 1.173, the applicants submit the following statement of claim status and support for in the disclosure of the patent for all claims as of November 6, 2003. The text of each claim is recited, followed by the status of the claim and a reference to at least one of the portions of the disclosure supporting the claim.

1. A method for forming a generally tubular device for placement in a lumen of a patient's body, the method comprising:
  - (a) coating an external surface of a mold with a coating;
  - (b) removing a portion of the coating to form a pattern corresponding to a desired shape of the generally tubular device for placement in a lumen of a patient's body;
  - (c) forming a depressed pattern in the external surface of the mold with the depressed pattern corresponding to the pattern in the coating and the desired shape of the generally tubular device for placement in a lumen of a patient's body;

- (d) depositing a material in the depressed pattern for the material to form the generally tubular device conforming with the depressed pattern; and
  - (e) separating the generally tubular device from the mold. (pending, in original patent)
2. A method according to claim 1 wherein the step of separating the generally tubular device from the mold comprises:
- (a) separating the generally tubular device from the mold by chemically etching the mold while leaving the tubular device substantially unetched. (pending, in original patent)
3. A method according to claim 1 wherein the step of coating an external surface of a mold with a coating comprises:
- (a) coating an external surface of a substantially cylindrical mold with the coating. (pending, in original patent)
4. A method according to claim 3 wherein the step of forming a depressed pattern in an external surface of the mold comprises:
- (a) forming a depressed pattern in an external surface of the substantially cylindrical mold, the depressed pattern surrounding a cylindrical axis of the mold. (pending, in original patent)
5. A method according to claim 4 wherein the step of forming a depressed pattern in an external surface of the substantially cylindrical mold comprises:
- (a) chemically etching the depressed pattern into the external surface of the substantially cylindrical mold. (pending, in original patent)
6. A method according to claim 1 wherein after the step of forming a depressed pattern in the external surface of the mold and before the step of depositing a material in the depressed pattern, removing the coating from the external surface to expose an undepressed remainder. (pending, in original patent)

7. A method according to claim 6 wherein the step of depositing a material in the depressed pattern comprises:
  - (a) depositing a material in the depressed pattern and at least partially on the undepressed remainder. (pending, in original patent)
8. The method according to claim 7, further comprising:
  - (a) removing the material from the undepressed remainder. (pending, in original patent)
9. A method according to claim 5 comprising:
  - (a) applying a photo-resist coating to the external surface of the mold;
  - (b) photo-imaging a pattern corresponding to the depressed pattern onto the photo-resist coating;
  - (c) developing the photo-resist coating to remove the pattern and expose the external surface of the mold corresponding to the depressed pattern; and
  - (d) chemically etching the mold to remove mold material exposed by the pattern and form the depressed pattern. (pending, in original patent)
10. A method according to claim 1 wherein the step of depositing a material comprises:
  - (a) vapor depositing of the material. (pending, in original patent)
11. A method according to claim 1 wherein the step of depositing a material comprises:
  - (a) flowing the material in a molten state into the depressed pattern. (pending, in original patent)
12. A method according to claim 1 wherein the step of depositing a material comprises:
  - (a) surrounding the external surface of the mold with a tube of the material; and

(b) urging the material radially inwardly into the depressed pattern. (pending, in original patent)

13. A method of making an intraluminal device, comprising:  
forming a pattern in a surface of a mandrel;  
depositing a device material in the pattern; and  
dissolving the mandrel. (pending, col. 3, lines 48-50; col. 3, lines 53-54; col. 4, lines 55-57)
14. A method of making an intraluminal device according to claim 13, wherein the mandrel comprises at least one of a rod and a tube. (pending, col. 3, lines 45-47)
15. A method of making an intraluminal device according to claim 13, wherein the intraluminal device is at least one of a stent and a catheter. (pending, col. 3, lines 18-22)
16. A method of making an intraluminal device according to claim 13, wherein the device material comprises at least one of titanium, tantalum, niobium, zirconium, stainless steel, and platinum. (pending, col. 3, line 29; col. 5, lines 22-25)
17. A method of making an intraluminal device according to claim 13, wherein the mandrel comprises at least one of stainless steel, molybdenum, and tungsten. (pending, col. 3, lines 32-34; col. 5, lines 24-26)
18. A method of making an intraluminal device according to claim 13, wherein an outside diameter of the mandrel is greater than an outside diameter of the intraluminal device. (pending, col. 3, lines 40-42)
19. A method of making an intraluminal device according to claim 13, further comprising removing an excess portion of at least one of the device material and the mandrel. (pending, col. 3, lines 42-45)

20. A method of making an intraluminal device according to claim 19, wherein removing the excess portion comprises at least one of grinding and machining the at least one of the device material and the mandrel. (pending, col. 4, lines 46-47)
21. A method of making an intraluminal device according to claim 13, wherein forming the pattern comprises photoetching the surface. (pending, col. 3, lines 60-63)
22. A method of making an intraluminal device according to claim 21, wherein photoetching the surface includes etching to a selected depth, wherein the selected depth is less than the thickness of the mandrel. (pending, col. 4, lines 22-29)
23. A method of making an intraluminal device according to claim 13, wherein depositing the device material comprises at least one of vapor depositing, casting, electro-forming, forging, crimping, sputtering, plating, and sintering the device material in the pattern. (pending, col. 5, lines 38-46)
24. A method of making an intraluminal device according to claim 13, wherein the pattern includes a rounded bottom. (pending, col. 4, lines 62-63)
25. A method of making an intraluminal device according to claim 13, wherein the pattern includes more than substantially one depth. (pending, col. 5, lines 11-13)
26. A method of making an intraluminal device according to claim 13, wherein the device material comprises more than one layer of materials. (pending, col. 5, lines 17-18)
27. A method of making an intraluminal device according to claim 13, wherein the device material comprises a radiopaque material. (pending, col. 5, lines 18-20)
28. A method of making an intraluminal device according to claim 13, depositing the device material comprises overfilling the pattern. (pending, col. 4, lines 41-43)

29. A method of making an intraluminal device according to claim 13, wherein the pattern is formed by at least one of chemical milling, laser milling, electro-discharge machining, casting, and machining. (pending, col. 5, lines 30-35)
30. A stent comprising a stent material, wherein the stent material is formed in a pattern on a mandrel. (pending, col. 4, lines 37-39)
31. A stent according to claim 30, wherein the mandrel comprises at least one of a rod and a tube. (pending, col. 3, lines 45-47)
32. A stent according to claim 30, wherein the stent material comprises at least one of titanium, tantalum, niobium, zirconium, and platinum. (pending, col. 3, line 29; col. 5, lines 22-25)
33. A stent according to claim 30, wherein the mandrel comprises at least one of stainless steel, molybdenum, and tungsten. (pending, col. 3, lines 32-34; col. 5, lines 24-26)
34. A stent according to claim 30, wherein an outside diameter of the mandrel is greater than an outside diameter of the intraluminal device. (pending, col. 3, lines 40-42)
35. A stent according to claim 30, wherein the stent material is further formed by removing an excess portion of at least one of the stent material and the mandrel. (pending, col. 3, lines 42-45)
36. A stent according to claim 35, wherein removing the excess portion comprises at least one of grinding and machining the at least one of the stent material and the mandrel. (pending, col. 4, lines 46-47)

37. A stent according to claim 30, wherein the pattern is formed by photoetching the surface.  
(pending, col. 3, lines 60-63)
38. A stent according to claim 37, wherein photoetching the surface includes etching to a selected depth, wherein the selected depth is less than the thickness of the mandrel.  
(pending, col. 4, lines 22-29)
39. A stent according to claim 30, wherein the stent material is formed in the pattern by at least one of vapor depositing, casting, electro-forming, forging, crimping, sputtering, plating, and sintering the device material in the pattern. (pending, col. 5, lines 38-46)
40. A stent according to claim 30, wherein the pattern includes a rounded bottom. (pending, col. 4, lines 62-63)
41. A stent according to claim 30, wherein the pattern includes more than substantially one depth. (pending, col. 5, lines 11-13)
42. A stent according to claim 30, wherein the stent material comprises more than one layer of materials. (pending, col. 5, lines 17-18)
43. A stent according to claim 30, wherein the stent material comprises a radiopaque material. (pending, col. 5, lines 18-20)
44. A stent according to claim 30, wherein the stent material is formed by overfilling the pattern. (pending, col. 4, lines 41-43)
45. A stent according to claim 30, wherein the pattern is formed by at least one of chemical milling, laser milling, electro-discharge machining, casting, and machining. (pending, col. 5, lines 30-35)

46. A stent according to claim 30, wherein the mandrel comprises a soluble material.  
(pending, col. 3, lines 31-35)
47. A stent formed by the process of:  
forming a mandrel having a stent pattern;  
providing a stent material in the stent pattern; and  
dissolving the mandrel. (pending, col. 3, lines 48-50; col. 3, lines 53-54; col. 4, lines 55-57)
48. A stent according to claim 47, wherein the mandrel comprises at least one of a rod and a tube. (pending, col. 3, lines 45-47)
49. A stent according to claim 47, wherein the stent material comprises at least one of titanium, tantalum, niobium, zirconium, and platinum. (pending, col. 3, lines 45-47)
50. A stent according to claim 47, wherein the mandrel comprises at least one of stainless steel, molybdenum, and tungsten. (pending, col. 3, lines 32-34; col. 5, lines 24-26)
51. A stent according to claim 47, wherein an outside diameter of the mandrel is greater than an outside diameter of the intraluminal device. (pending, col. 3, lines 40-42)
52. A stent according to claim 47, wherein the stent is further formed by removing an excess portion of at least one of the stent material and the mandrel. (pending, col. 3, lines 42-45)
53. A stent according to claim 52, wherein removing the excess portion comprises at least one of grinding and machining the at least one of the stent material and the mandrel.  
(pending, col. 4, lines 46-47)
54. A stent according to claim 47, wherein the pattern is formed by photoetching the surface.  
(pending, col. 3, lines 60-63)



55. A stent according to claim 54, wherein photoetching the surface includes etching to a selected depth, wherein the selected depth is less than the thickness of the mandrel. (pending, col. 4, lines 22-29)
56. A stent according to claim 47, wherein providing stent material in the pattern includes at least one of vapor depositing, casting, electro-forming, forging, crimping, sputtering, plating, and sintering the stent material in the pattern. (pending, col. 5, lines 38-46)
57. A stent according to claim 47, wherein the pattern includes a rounded bottom. (pending, col. 4, lines 62-63)
58. A stent according to claim 47, wherein the pattern includes more than substantially one depth. (pending, col. 5, lines 11-13)
59. A stent according to claim 47, wherein the stent material comprises more than one layer of materials. (pending, col. 5, lines 17-18)
60. A stent according to claim 47, wherein the stent material comprises a radiopaque material. (pending, col. 5, lines 18-20)
61. A stent according to claim 47, wherein the stent material is provided by overfilling the pattern. (pending, col. 4, lines 41-43)
62. A stent according to claim 47, wherein the pattern is formed by at least one of chemical milling, laser milling, electro-discharge machining, casting, and machining. (pending, col. 5, lines 30-35)

63. An assembly for forming a stent, comprising:  
a mandrel comprising a surface, wherein a pattern is formed in the surface of the mandrel; and  
a stent material in the pattern. (pending, col. 3, lines 48-50; col. 3, lines 53-54)
64. An assembly according to claim 63, wherein the mandrel comprises at least one of a rod and a tube. (pending, col. 3, lines 45-47)
65. An assembly according to claim 63, wherein the stent material comprises at least one of titanium, tantalum, niobium, zirconium, and platinum. (pending, col. 3, lines 45-47)
66. An assembly according to claim 63, wherein the mandrel comprises at least one of stainless steel, molybdenum, and tungsten. (pending, col. 3, lines 32-34; col. 5, lines 24-26)
67. An assembly according to claim 63, wherein an outside diameter of the mandrel is greater than an outside diameter of the stent. (pending, col. 3, lines 40-42)
68. An assembly according to claim 63, wherein the assembly is formed by removing an excess portion of at least one of the stent material and the mandrel. (pending, col. 4, lines 46-47)
69. An assembly according to claim 68, wherein removing the excess portion comprises at least one of grinding and machining the at least one of the stent material and the mandrel. (pending, col. 4, lines 46-47)
70. An assembly according to claim 63, wherein the pattern is formed by photoetching the surface. (pending, col. 3, lines 60-63)

71. An assembly according to claim 70, wherein photoetching the surface includes etching to a selected depth, wherein the selected depth is less than the thickness of the mandrel.  
(pending, col. 4, lines 22-29)
72. An assembly according to claim 63, wherein the stent material is provided in the pattern by at least one of vapor depositing, casting, electro-forming, forging, crimping, sputtering, plating, and sintering the device material in the pattern. (pending, col. 5, lines 38-46)
73. An assembly according to claim 63, wherein the pattern includes a rounded bottom.  
(pending, col. 4, lines 62-63)
74. An assembly according to claim 63, wherein the pattern includes more than substantially one depth. (pending, col. 5, lines 11-13)
75. An assembly according to claim 63, wherein the stent material comprises more than one layer of materials. (pending, col. 5, lines 17-18)
76. An assembly according to claim 63, wherein the stent material comprises a radiopaque material. (pending, col. 5, lines 18-20)
77. An assembly according to claim 63, wherein the stent material overfills the pattern.  
(pending, col. 4, lines 41-43)
78. An assembly according to claim 63, wherein the pattern is formed by at least one of chemical milling, laser milling, electro-discharge machining, casting, and machining.  
(pending, col. 5, lines 30-35)
79. An assembly according to claim 63, wherein the mandrel comprises a soluble material.  
(pending, col. 3, lines 31-35)

80. A mandrel for forming an intraluminal device comprising an outer surface, wherein the outer surface includes a device pattern formed therein. (pending, col. 3, lines 48-50)
81. A mandrel according to claim 80, wherein the mandrel comprises at least one of a rod and a tube. (pending, col. 3, lines 45-47)
82. A mandrel according to claim 80, wherein the mandrel comprises at least one of stainless steel, molybdenum, and tungsten. (pending, col. 3, lines 32-34; col. 5, lines 24-26)
83. A mandrel according to claim 80, wherein an outside diameter of the mandrel is greater than an outside diameter of the intraluminal device. (pending, col. 3, lines 40-42)
84. A mandrel according to claim 80, wherein the device pattern is formed by photoetching the surface. (pending, col. 3, lines 60-63)
85. A mandrel according to claim 84, wherein photoetching the surface includes etching to a selected depth, wherein the selected depth is less than the thickness of the mandrel. (pending, col. 4, lines 22-29)
86. A mandrel according to claim 80, wherein the device pattern includes a rounded bottom. (pending, col. 4, lines 62-63)
87. A mandrel according to claim 80, wherein the device pattern includes more than substantially one depth. (pending, col. 5, lines 11-13)
88. A mandrel according to claim 80, wherein the device pattern is formed by at least one of chemical milling, laser milling, electro-discharge machining, casting, and machining. (pending, col. 5, lines 30-35)

89. A mandrel according to claim 80, wherein the mandrel comprises a soluble material.  
(pending, col. 3, lines 31-35)

### CONCLUSION

If there are any questions or problems, please contact the undersigned at the telephone number indicated below.

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